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# INITIAL ACCREDITATION

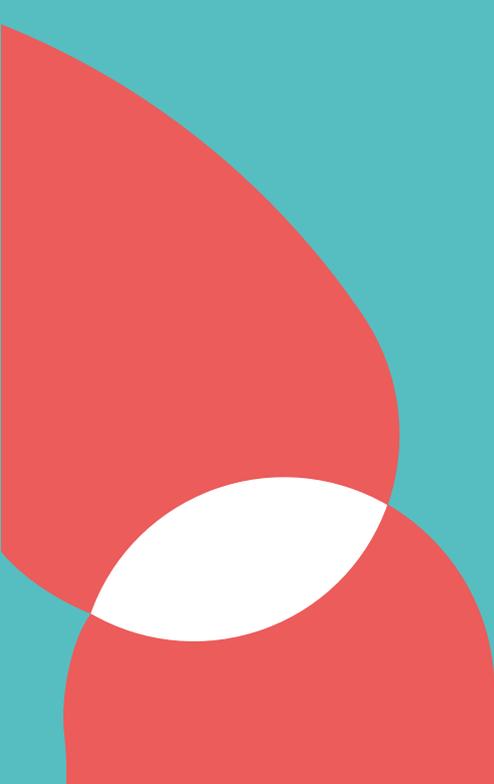
WO-BACHELOR

SUSTAINABLE BIOSCIENCE

Maastricht University

FULL REPORT

15 MAY 2025



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## 1 Peer review

The Accreditation Organisation of the Netherlands and Flanders (NVAO) determines the quality of a new programme on the basis of a peer review. This initial accreditation procedure is required when an institution wishes to award a recognised degree after the successful completion of a study programme.

The procedure for new programmes differs slightly from the approach to existing programmes that have already been accredited. Initial accreditation is in fact an ex ante assessment of a programme. Once accredited the new programme becomes subject to the regular review process.

The quality of a new programme is assessed by means of peer review. A panel of independent peers including a student reviews the plans during a site visit to the institution. A discussion amongst peer experts forms the basis for the panel's final judgement and the advisory report. The agenda for the panel visit and the documents reviewed are available from the NVAO office upon request.

The outcome of this peer review is based on the standards described and published in the limited NVAO Assessment framework for the higher education accreditation system of the Netherlands (Stcrt. 2019, nr. 3198). Each standard is judged on a three-point scale: meets, does not meet or partially meets the standard. The panel will reach a conclusion about the quality of the programme, also on a three-point scale: positive, conditionally positive or negative.

NVAO takes an accreditation decision on the basis of the full report. Following a positive NVAO decision with or without conditions the institution can proceed to offer the new programme.

This report contains the findings, analysis and judgements of the panel resulting from the peer review. It also details the commendations as well as recommendations for follow-up actions. A summary report with the main outcomes of the peer review is also available.

Both the full and summary reports of each peer review are published on NVAO's website [www.nvao.net](http://www.nvao.net). There you can also find more information on NVAO and peer reviews of new programmes.

## 2 New programme

### 2.1 General data

<b>Institution</b>	Universiteit Maastricht
<b>Programme</b>	WO-Bachelor Sustainable Bioscience
<b>Variants</b>	Fulltime: Yes. Parttime: No. Dual: No.
<b>Degree</b>	Bachelor of Science
<b>Tracks</b>	Planetary Systems; Agricultural Systems; Food Systems
<b>Locations</b>	Venlo
<b>Study load</b>	180 EC <sup>1</sup>
<b>Field of study</b>	Cross-sectoral

### 2.2 Profile

The BSc Sustainable Bioscience aims to educate students who will be able to contribute to a sustainable future for planet Earth. A systems perspective is required to understand the structure and behaviour of biological and earth systems. The programme is characterised by a strong inter- and transdisciplinary structure within the field of biosciences, focusing on the natural environment, agriculture, and healthy nutrition. Topics within (elective) courses are approached from general biology, earth sciences, plant sciences, as well as nutrition and behavioural sciences, with increasing complexity and integration as students progress through the programme. The three specialisation tracks—Planetary Systems, Agricultural Systems, and Food Systems—further emphasize the cross-sectoral nature of the intended programme.

### 2.3 Panel

#### Peer experts

1. Prof. dr. V. (Vera) van Noort (chair), Professor in Computational Systems Biology, Faculty of Bioscience Engineering, KU Leuven; Professor in Computational Biology, Institute for Biology Leiden (IBL), Leiden University;
2. Dr. S.I. (Inge) The (member), Associate Professor and Programme Director Bachelor Programme Biology, Utrecht University;
3. Ing. F.P.M. (Frank) van der Helm MSc (member), Associate lector living plant production systems, Inholland University of Applied Sciences;
4. V. (Vincent) van der Wolf BSc (student-member), Master student Population Health Management, Leiden University.

#### Assisting staff

Dr. M.J.H. (Marianne) van der Weiden (secretary)  
Anne Klaas Schilder MA (NVAO policy advisor and process coordinator)

#### Site visit

Venlo, 15 April 2025.

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<sup>1</sup> European Credits

### 3 Outcome

The NVAO approved panel reaches a positive conclusion regarding the quality of the bachelor programme in Sustainable Bioscience offered by Maastricht University. The programme complies with all standards of the limited NVAO framework.

The bachelor programme in Sustainable Bioscience is a three-year fulltime interdisciplinary programme, to be organized on the Brightlands Campus Greenport Venlo. Graduates will be able to contribute to solutions of sustainability problems, based on a solid basis of knowledge and skills in (plant) biology, earth science, food and nutrition science, consumer behaviour, data and technology. The intended learning outcomes include that they will be critical thinkers and able to work effectively with stakeholders. The intended learning outcomes reflect the aims of the programme and the internationally recognized bachelor level. Ties with the work field are strong. Companies have been involved in the development of the programme and will provide opportunities for project work. The panel advises keeping the work field engaged in a systematic manner, including non-governmental organisations.

The programme is built on an articulate vision on education and assessment. A system of constructive alignment ensures that there is a direct relationship between learning outcomes, teaching and learning activities and student assessment. After a foundation year, students design an individual study path and select courses that fit their interests and prepare them for the master's programme of their choice. An academic advisor will help them to make the right choices. The curriculum consists of courses, skills trainings and projects. For some projects, the scheduled three-weeks fulltime period may be unpractical and should perhaps be replaced by a parttime project over a longer period of time. The panel advises looking into this. Students will work in small groups on real-life problems. This system of Problem-Based Learning stimulates active learning and the development of social skills. Research-Based Learning helps students to systematically acquire research skills. At the end of the third year, they will demonstrate these skills in an individual thesis research project. The increasingly international and globalized labour market and the geographical location of the programme with a large influx from Belgium and Germany are valid reasons to offer the programme in English. The resulting international classroom teaches students to work in a multicultural setting and take into account different perspectives when working on a problem. The admission requirements and matching procedure will attract students with a good chance of successfully completing the programme. Teachers are part of leading research groups and are didactically well-qualified. Students can approach them easily with questions. Counselling and facilities are available for students with extra needs. Next year, student housing and restaurant facilities will be built on the campus. Public transport and social initiatives still need attention.

Assessment is seen as part of the learning process. Therefore, assessments are not only used to monitor the students' level of knowledge and skills, but also to give feedback and stimulate further learning. Teachers use an appropriate variety of assessment forms, such as written exams, presentations, lab journals and reports. When working in teams, assessment will include self-evaluation and peer evaluation. An assessment plan assures that assessments are in line with the learning objectives per course, the syllabi inform students what to expect and grading guidelines contribute to reliable outcomes. Some of these guidelines should be more specific. Teachers and the Board of Examiners are aware of the advantages and risks of Generative Artificial Intelligence. The panel advises keeping a close watch on this development and helping teachers to design AI-proof assessments. The Board of Examiners has given advice in the development phase of the programme and will monitor the quality of assessment and level of the programme closely.

The panel concludes that the programme is a strong and relevant initiative, both in content and flexibility. All conditions are in place to guarantee students a well-organised programme, supported by the necessary personal and material facilities. The panel, therefore, expresses its confidence in the quality of the programme.

Standard	Judgement
1. Intended learning outcomes	meets the standard
2. Teaching-learning environment	meets the standard
3. Student assessment	meets the standard
<i>Conclusion</i>	<i>positive</i>

## 4 Commendations

The programme is commended for the following features of good practice.

1. Societal relevance – Upon graduation, students will be critical thinkers who can contribute to the solution of sustainability problems by combining their broad knowledge of plant biology, earth science, food and nutrition science, and consumer behaviour.
2. Balance between structure and flexibility – The curriculum starts with foundational courses for all students. After that, students follow their own study path and select courses that fit their strengths, interests and future career ambitions, guided by an academic advisor.
3. Active learning in small groups – In the university's educational system of Problem-Based Learning, students work together on real-life problems.
4. Strong connections with the work field – Interaction with companies on and off the campus is intensive and based on previous positive experiences. Companies provide input for projects and theses and have a strong interest to recruit students from the programme after a subsequent relevant master programme.
5. Experienced teaching team – Teachers are part of leading research groups and have ample experience in teaching, supervising and advising students.

## 5 Recommendations

For further improvement to the programme, the panel recommends a number of follow-up actions.

1. Ties with professional field – Formalise and extend the existing contacts with companies and organisations by inviting them to be part of an advisory board and include relevant non-governmental organisations as well.
2. Feasibility of three-weeks projects – Check internally and with external partners if the time frame for projects must be limited to a three weeks' fulltime period or if in some cases better results can be obtained when projects are spread out over a longer period.
3. Campus life – Stimulate a vibrant campus life by organising more frequent public transport and helping students to set up a student association and to organise social activities, related to the content and philosophy of the programme.
4. Generative Artificial Intelligence – Monitor the development of Generative AI closely, let staff and students use it when appropriate and ensure that it cannot be misused in exams and assignments.
5. Grading – Make sure that staff and students know what level must be achieved in projects and assignments over the years, by making the grading guidelines (rubrics) more specific and maintaining an adequate balance between formative and summative assessment.

## 6 Assessment

### 6.1 Standard 1: Intended learning outcomes

*The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.*

#### **Judgement**

Meets the standard.

#### **Findings, analysis and considerations**

The proposed bachelor programme in Sustainable Bioscience is an interdisciplinary programme that intends to address urgent societal and scientific challenges related to a sustainable future. The focus is on sustainable, plant-based food production and consumption in the context of a healthy planet Earth. The reference to the UN sustainable development goals and the importance of dealing with climate change, soil erosion, water supply and food production is justified and shows the relevance of the proposed programme. The programme aims to educate students who can think critically, across disciplines and on a systemic level. Graduates will be able to develop and implement healthy solutions, grounded in biology, working closely together with stakeholders. They will have solid knowledge and skills in (plant)biology, biogeoscience, food and nutrition science, and will be able to effectively use data and technology.

The aims of the programme not only emphasize the breadth of academic knowledge, including biology, mathematics and sustainability science, but also the ability to analyse and apply this knowledge in a chosen concentration. Additionally, they stress an adequate scientific and intellectual attitude, awareness of the environmental and societal contexts and the development of (inter)personal skills. These aims are well-reflected in the intended learning outcomes. The panel appreciates that the intended learning outcomes focus on system thinking in the broad area of sustainability and biology and that they include communication skills and reflection on social and ethical aspects. These are crucial to design successful solutions to regional and international sustainability challenges. Based on the principle of constructive alignment, the intended learning outcomes have been translated into learning objectives per module (courses, skills, research projects and thesis) with an increasing level of complexity and specificity over the three years of the programme. The panel confirms that the intended learning outcomes are linked to the Dublin descriptors at bachelor's level and correspond to level 6 of the Dutch National Qualification Framework (NLQF).

The interdisciplinary nature of the programme is a strength, but a possible drawback of such a broad programme is that graduates will not gain sufficient depth in each discipline or be prepared for specific master programmes. The panel's concern was specifically with sociology, which seemed represented least in the programme. During the site visit, the panel was reassured that the programme will provide all students with a solid knowledge base, especially in the first year. Sociology will e.g. be part of two core courses, Consumer Behaviour and Sustainable Development. In the second and third year, students will have a certain freedom to design their study path through the curriculum, taking into account the entrance requirements of the master's programme of their choice and supported by an academic advisor. The experience with similar interdisciplinary programmes in the Faculty of Science and Engineering shows that graduates are well-accepted by both national and international master programmes.

The programme will be part of the Faculty of Science and Engineering and thus profit from the faculty's research environment. It will be organized on the university's Brightlands Campus Greenport Venlo. This location reflects the close connection between the programme and regional partners, which was further illustrated in the panel's meeting with a number of company representatives. These have been actively involved in the development of the programme and are especially enthusiastic about its emphasis on crossovers and critical thinking. They are willing to accept and supervise students in projects. Currently, their experience is with bachelor students from universities of applied sciences. The panel suggests making them aware of what to expect from academic bachelor students. They would also like to remain involved in the future to help ensure that the programme remains up to date and in line with developments in the field, e.g. as guest lecturers or as members of an advisory board. The panel agrees with them that an advisory board should also comprise representatives of relevant non-governmental organisations (NGOs).

The panel concludes that the intended learning outcomes of the bachelor programme in Sustainable Bioscience are academically sound and societally relevant. The panel especially appreciates the interdisciplinary approach and the emphasis on critical thinking and social awareness. The explicit development of research skills and interpersonal skills will prepare the students to work together on sustainability problems. The strong ecosystem of the Brightlands Campus will provide students with a range of possibilities to work on relevant projects. The panel notes a strong feeling of goodwill in the companies. The panel advises keeping the programme's company partners involved in the implementation and further development of the programme and extending the range of partners by inviting NGO representatives as well. The panel concludes that the programme meets standard 1.

## 6.2 Standard 2: Teaching-learning environment

*The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.*

### Judgement

Meets the standard.

### Findings, analysis and considerations

#### Curriculum

The fulltime three-year programme consists of 180 EC and is divided into six semesters. The first four semesters are divided into three periods, following the 8-7-3-week model of the Faculty of Science and Engineering. In each of the first two periods, students follow two courses of 5 EC and a skills training of 2.5 EC. In the three-week period, students work on an integrated research project. In the fifth semester, students have chosen a so-called concentration (Planetary Systems, Agricultural Systems or Food Systems) Each concentration offers four mandatory courses and two mandatory skills trainings, followed by a sustainable system design project. The sixth semester is devoted to the bachelor thesis based on individual research, allowing students to realise their academic profile (30 EC). Students can get involved with ongoing research projects of a research group or corporate R&D team.

Year 1 consists of eight compulsory courses and four skills trainings, covering the disciplines underlying sustainable bioscience, including biology, food and nutrition, mathematics and sustainability science. This is an appropriate mix to provide students with the necessary theoretical and practical foundation for the rest of the programme. In year 2, students select two courses and one skills training per period from a range of six elective courses and three skills trainings. The choice is free, except for one course in the fourth semester: each concentration has indicated one course as a prerequisite. This mix of compulsory courses and freedom of choice is well-balanced. The possibility for each student to choose their own study path strengthens the study motivation and allows students to tailor the programme to the entrance requirements of a specific master programme. Both staff and students from similar interdisciplinary programmes with an even more open structure, emphasised in their meeting with the panel that such a combination works well, especially with the guidance of academic advisors. All students are assigned an academic advisor with whom they have two meetings per year. Academic advisors are responsible for a group of twenty students. The Educational Programme Committee (EPC) and the Board of Examiners (BoE) inform the academic advisors which combinations of courses are appropriate, taking into account a student's further perspectives.

The panel confirms that the curriculum offers an appropriate combination of contents. All students will learn to work with Excel and the statistical software and programming language 'R'. This will provide a sufficient basis for the modelling course in year 3, but students can gain additional experience with other tools and programmes in elective courses. The position of sociology was not entirely clear from the documentation, but this perspective, including socio-economic theories and human-nature interaction, is integrated in a number of courses, such as in the conceptual first-year course on sustainable development. This reflects the programme's philosophy to integrate the various knowledge areas as much as possible. Similarly, the combination of a molecular biotechnology approach on the one hand and the holistic regenerative approach on the other hand is a deliberate choice. Students will work from gene level to climate level, since problems cannot be solved by one perspective only. They need to understand an issue in the larger context. This approach will also accommodate students with different interests.

As mentioned above, each semester ends with a three-week research project. These are meant to train students to work in teams, develop their problem-solving skills and prepare them for conducting scientific research. The first project will be the same for all students and will cover the basic aspects of scientific research. Students will write a literature review and practise the collection and management of research data. The following four projects, including the Grand Challenge in year 3, will be based on research problems, presented by scientific staff or external stakeholders. Students will work in teams of 5-8 students, supported by an academic staff member, and go into the lab, the field or collect computer-based data. The teaching staff is aware that three weeks for a project in the field is very short, even when the topic and materials are prepared in advance. The company representatives agree with the teaching team that it will be possible to set up feasible projects, but suggest that spreading out a project over a longer period of time during one day per week may in some cases be more practical and lead to better results.

#### Didactic approach

As in all teaching programmes of Maastricht University, teaching and learning in the programme are built on the principles of Problem-Based Learning (PBL) and Research-Based Learning (RBL). In PBL, students work together in small tutorial groups of 8-14 students to develop the required knowledge, skills and attitudes. The panel agrees that the interaction between students and staff facilitates the integration of research into the educational process and that the problem-based approach is very suitable to address complex problems and practise systems thinking. Attendance is required for the PBL group meetings and students must spend their self-study hours to complete specified tasks in preparation for the next tutorial meeting. In addition to the group meetings in a course, the teaching staff organises lectures, e.g. to introduce a topic, work out an example or set a quiz to check the students' level of knowledge.

RBL starts with small research problems in the tutorial groups and research-based skills training sessions. Gradually, research challenges will become more complex. In the projects, students develop their research skills in a team-based, more open-ended research project where curiosity-driven problem solving is required. Frequent contacts with relevant industry partners during the programme will give students the chance to learn about the valorisation of scientific knowledge.

During the site visit, the panel met with a number of students from University College Venlo and the Maastricht Science Programme. Both groups have PBL as main form of instruction. They also have the academic advisors. This made them a helpful source of information for the panel. The students emphasised how valuable the PBL groups and the international classroom are to learn from each other. The multicultural and multidisciplinary composition of the groups brings different experiences and viewpoints together, which can be used to come up with different solutions for the shared goal of solving a specific problem. The tutorial groups and project work are quite useful for the development of social skills. The peer review sessions at the end of a project period are a good example.

#### Student guidance

Academic advisors help students to find their way through the curriculum and make the right choices in their selection of courses. All students are assigned an academic advisor at the start of their studies. Academic advisors are members of the academic staff and have a link to the programme as a lecturer, coordinator or content expert. They meet with their students at least twice a year, especially when choices have to be made, and more often if needed. Students feel well-supported. They find their advisors, and teaching staff in general, very approachable. If the advisor does not match with the student's interest or personality, a new advisor can be assigned.

The students are aware that additional guidance and support are available in case of physical or learning disabilities or personal problems. They mentioned various support mechanisms, such as the study advisor at the faculty level and the student counsellor. The students appreciate that adjustments can be made if necessary and that this support is actively promoted.

#### Admission requirements

The programme has formulated suitable admission requirements. A strong basis, not only in biology but also in mathematics, is necessary, specifically for the understanding of dynamic systems, modelling and statistical data analysis. Applicants with a Dutch VWO degree with NT & biology or NG & mathematics, or an equivalent international degree, will be sufficiently prepared for a successful completion of the programme. Minimum grades are not required. Instead, the programme has set up a matching procedure which consists of an online

survey and/or an interview with a staff member to make sure that students know what to expect. The programme intends to check student success related to incoming grades and to use the outcomes to inform future students. The panel agrees that this is a useful method.

As English is the language of instruction in the programme, applicants must also have sufficient language skills. A minimum level corresponding to academic IELTS 6.0 is required for admission, in line with the standards of the university's admissions language requirements.

#### Language

The choice for English as the language of instruction is well-motivated. It is in line with the demand from the increasingly international and globalized labour market, students moving into subsequent English-language master programmes and the geographical location of the programme with a large influx from Belgium and Germany. The language of instruction and the name of the programme also match with the context described for the field of bioscience in the Sector Portrait 2020.

The panel was informed that students in Maastricht University typically come from the Netherlands (30%), neighbouring countries (30%), other European countries (30%) and non-European countries (10%). Choosing English as the common language makes communication and cooperation within the programme and with the outside academic and professional community possible. The university's language policy ensures that staff and students meet the necessary language requirements to fully participate in the educational activities. Scientific staff involved in teaching for more than 10% of their appointment must have a minimum English language proficiency level of C1. As mentioned above, students must have a minimum level corresponding to academic IELTS 6.0. International staff members are encouraged to attain a minimum language proficiency level of B1 in Dutch. The university offers international students the opportunity to improve their Dutch language skills.

The panel's meeting with students shows that the resulting international classroom with its diversity is much appreciated as a strong learning environment. The panel agrees that the resulting ability to work with multicultural teams is an advantage in today's labour market.

#### Teaching staff

The programme's teaching staff covers the different disciplines of bioscience and related natural sciences, food and nutrition, mathematics and sustainability science. Coordinators of modules must have a PhD and an established academic position. This makes them well-embedded in research and ensures that they know about the latest development in their field. By using additional tutors in the PBL-groups and assistants in skills trainings, the favourable student-staff ratio can be maintained, even when student numbers increase. The lecturers assured the panel that the workload, e.g. related to academic advising, is evenly distributed among them.

Teaching staff is didactically well-qualified. They must have achieved the University Teaching Qualification (UTQ) or be in the process of obtaining this certification within two years of employment, and are encouraged to participate in the university's Continuing Professional Development programme. Examiners must have a UTQ certificate and a PhD degree. Education and assessment specialists assist teaching staff in the development of courses, assessment and quality control. As mentioned above, a minimum English language proficiency level of C1 is required.

The content of the programme is strongly aligned with the faculty's research themes. The panel confirms that the research groups involved in the programme are prominent in the fields of biology, earth sciences, food production, agriculture and healthy food, modelling and systems analysis. The teaching team is very knowledgeable about the development of adaptive expertise, which provides a strong basis for the content and RBL approach of the programme. Their frequent interaction with the ecosystem on the campus is an asset.

#### Facilities

The programme will be taught at the Brightlands Campus Greenport Venlo, home to over 70 companies that are active in agrifood. A short tour during the site visit illustrated the range of enterprises, startups, educational institutions and public and private research institutes. A new faculty building is available, with small-group rooms specially designed for PBL education, a lecture hall, laboratories and greenhouse facilities. These facilities will be expanded when student numbers increase. The programme expects that the student numbers will grow fast and is optimistic about its capacity to handle this growth in terms of teaching staff and facilities. Students may also

use the research facilities of companies at the campus with which the university has research collaborations. The panel agrees with the programme staff that the campus is an attractive place and encourages the programme to make good use of the green surrounding, also in the architecture of the buildings and in activities.

The bachelor programme in Sustainable Bioscience will be one of the first educational programmes on the campus. Together with the municipality of Venlo, the university intends to build student housing, along with sports and recreational facilities such as a bar and restaurant. At the moment, public transport is not yet sufficient. The programme management is aware that further steps are necessary. The panel also advises investing in the student community, e.g. by stimulating the establishment of a student association.

The Educational Programme Committee (EPC) will monitor the quality of education and advise the programme director about matters concerning the curriculum and educational quality. The committee will consist of both students and staff representatives, but the actual membership will be determined upon the start of the programme. Based on the experience with other EPCs in the Faculty, the tasks of the committee will include discussion of the course evaluations, including the response rate and student comments. Negative outcomes will be flagged for future reference. In case a problem in a course occurs a second time, the EPC sends a letter to the teacher and asks the educational specialist to contact the teacher and provide help. If the problem persists for a third year, the letter will be sent by the Dean. The EPC checks if changes are made in response to the evaluations and if they lead to improvement. If a course turns out to be of an appropriate level, but is too difficult for many students, the advice may be to formulate prerequisites.

Summing up, the panel notes a considerable number of strong points in the programme's teaching-learning environment. The curriculum provides a good balance between a structured study path and flexibility. Students will be able to select courses that fit their strengths, interests and future career ambitions, guided by an academic advisor. The university's student-centred and activating didactic approach of PBL has proven itself over the years. The international classroom enhances the learning environment and prepares students for a multicultural labour market. The solid research base of the teaching staff will contribute to research-based learning, enabling students to develop their research skills from the beginning and preparing them for their bachelor thesis research. The admission requirements and procedure are appropriate. The teaching staff is academically and didactically well-qualified. Teachers are easily approachable for students. A point for further reflection is the feasibility of the three-weeks project periods. The management is aware that the accessibility of the campus needs to be improved. The panel also advises explicit attention to the development of a thriving student community. The panel concludes that the programme meets standard 2.

### 6.3 Standard 3: Student assessment

*The programme has an adequate system of student assessment in place.*

#### **Judgement**

Meets the standard.

#### **Findings, analysis and considerations**

Assessment in the programme is seen as a tool to support and enhance learning. This implies that the intended learning outcomes are directly linked to the teaching and learning activities and to assessment through a process of constructive alignment. Assessments should support CCCS (Constructive, Contextual, Collaborative and Self-directed) principles. Assessment must be authentic and relevant, embedded in teaching and learning activities, balanced between formative and summative assessment, and focused on the ability to use and apply the knowledge, understanding and skills.

This policy will be implemented in the new programme. In order to not only assess and monitor the students' knowledge, skills and performance, but also give timely feedback, all modules will have at least one moment of formative and two moments of summative assessment. The panel appreciates that a variety of assessment forms will be used, in line with the different types of knowledge, skills and attitudes to be achieved. Assessment forms in courses are, for example, written exams with open questions, reports, presentations and papers. In skills trainings and projects, assessment will take place on individual and team level. Content related assignments can be a demonstration of skills, a written report, lab journal or poster. In addition, assessment will include self-evaluation

and peer evaluation. In their meeting with the panel, the students explained the peer evaluation procedure and how supervisors guide them with care through the process.

Assessment of the bachelor thesis research follows a thorough procedure and will consist of five components: thesis proposal, midterm evaluation of practical work, final evaluation of practical work, written thesis and presentation and defence. The thesis coordinator is responsible for the overall quality of the theses and ensures consistency of feedback and grading. The research advisor (being the student's daily supervisor) and the internal thesis advisor independently assess the thesis (four-eyes principle). Their feedback and grades are evaluated and processed by the thesis coordinator. Standardised and structured rubrics are used to assess the process and product of the thesis research.

Quality of assessment is assured through various mechanisms. Students will be informed through the module syllabi, which makes the assessment sufficiently transparent. Assessment plans per module are designed with a colleague (four-eyes principle) and provide information about the validity of assessment and the application of constructive alignment. The programme director and course coordinators are responsible for the coordination of all courses, making sure that they add up to the intended learning outcomes. The validity of assessments may be compromised by the use of Generative Artificial Intelligence (GenAI). The panel found during the site visit that the programme is well-aware of this risk. A translation of a university-wide policy to faculty level is in the making. Management, teaching staff and Board of Examiners agree that GenAI can be a useful tool and students should learn to use it wisely. Some assessment methods, however, will be less adequate, such as writing a literature review. Module coordinators are responsible to design more suitable assessments, such as lab work, presentations, debate and exams in a controlled environment. Suspected unauthorised use of GenAI in assessment constitutes fraud and will be referred to the Board of Examiners (BoE) for an investigation. In view of the fast development of GenAI the panel advises monitoring this closely and advising teachers about GenAI-proof assessments. Grading sheets and rubrics and multiple moments of feedback will be used to safeguard the reliability of assessment. In preparation, the panel studied a number of module syllabi, including the grading rubrics. The panel found the formulation of the rubrics for the projects too general to make it clear to students and teachers what level is expected. The rubrics were identical for projects in consecutive years whereas one would expect more advanced learning outcomes and improvement of project skills over the course of the bachelor programme. The panel advises reworking the rubrics and linking them more closely to the level of projects (first, second or third year).

The BoE monitors and safeguards the quality of assessment and the level of the degree by determining whether a student upon graduation meets the requirements as described in the Education and Examination Regulations. To fulfil this responsibility, the BoE appoints the examiners, who must have a UTQ and a PhD degree. Each year, the BoE will review 25-30% of all assessments to check their quality. In preparation of the new programme, one member has checked all first-year syllabi for their alignment with the intended learning outcomes and the programme structure. Based on the documentation, the meeting during the site visit and the university's experience to set up a functional and effective BoE, the panel expects that the BoE will fulfil its responsibility adequately, although the actual composition of the BoE is not yet decided upon.

In conclusion, the panel commends the programme for its clear vision on assessment, the conscientious application of constructive alignment and the four-eyes principle, the variety of assessment forms, including self- and peer evaluation, the careful method of thesis assessment, and the role of the BoE. The development of GenAI is followed closely and this should certainly be kept up. It is commendable that rubrics are used to enhance the reliability of assessment, but the panel advises making them more specific. The panel concludes that the programme meets standard 3.

#### 6.4 Degree

The panel advises awarding the following degree to the new programme: Bachelor of Science

## Abbreviations

BoE	Board of Examiners
EER	Education and Examination Regulations
EPC	Educational Programme Committee
GenAI	Generative Artificial Intelligence
PBL	Problem-based learning
RBL	Research-based learning
UTQ	University Teaching Qualification

